

Summer 2009 Ontario Grid Facts from Bill Palmer

Combine that [lower temperatures and weak economy] with a summer when the Ontario nuclear generating fleet was mostly healthy. What this meant was that the roughly 10,000 MW of available nuclear generation combined with a certain amount of run of river hydraulic that has to operate (as the head ponds are limited) means that they were able to carry the load. BUT, the system was impacted by putting on line over the last few years some 3000 MW of co-generation [CCGT] natural gas plants, who produce both electricity for the grid and heat for an industrial user. This makes efficient use of the natural gas, but it also means that these plants do not want to reduce output or their customers are unhappy. To that we added about 1100 MW of new wind generation. This generation confuses the mix, as it is not "dispatchable" and cannot be run up and down between its upper and lower limits at the demand of the system controller. Worse, it has the habit of rising rapidly from low output to high output, and might do that at night, when the system load is at its lowest. To give the ability for this generation to be assimilated into the system the operator had to reduce something, and what they did for much of the summer was to ask for nuclear units to either reduce output at night or to shut down totally. This is because the nature of nuclear units is that they cannot rapidly reduce their power output without risking coming off line altogether. So, what happened this summer, was that to accommodate the fact that wind generators MIGHT come up at night, when load was low, the system operator shut down about 800 MW of nuclear units. (One Bruce Unit was shut down at system request for much of the summer.) However, in the daytime, if the wind generator was not available, then it was necessary to run up a rapidly responding alternate source of power to supply for the shut down nuclear unit. This typically meant running up a gas generator (in this case one uses a "simple cycle" gas generator that is not as efficient as a co-generation gas unit, but it is able to respond faster. It also meant that the price being paid to the normal generators was below the price that they need to cover their costs. That is a reason for big concern for long term viability.

As a result, in Ontario this summer, our CO2 emissions actually increased because of the 1100 MW of wind turbines. They required the shut down of non CO2 generating nuclear units which would have supplied both day and night, to give space for a wind generator that might only operate occasionally, and to operate a CO2 emitting gas generator if the wind generator was not available.